

PUBLIC UTILITIES ADVISORY BOARD AGENDA ITEM

ACTION REQUESTED:

Utility is seeking comment and support from PUAB to move forward with drafting an ordinance change in support of the proposed changes.

DEPARTMENT: Electric Utility

SUBMITTED BY: Lucille Podlesny, Director

BOARD/COMMISSION REVIEW:

N/A

BACKGROUND:

The number of electric vehicles registered in Naperville continues to increase, and while incentives for Level 2 and 3 charger installation in Naperville residences was included in the March 2020 Renewable Energy Program changes, the Electric Utility (Utility) continues to look for ways to encourage the adoption of Electric Vehicles and ensure their chargers are installed in a safe, code compliant manner. As of July 31, 2020, there were 265 Naperville permitted installations of electric vehicle chargers and about four times as many electric vehicles registered in Naperville zip codes according to the Illinois Secretary of State.

When seeking a permit for the installation of a Level 2 or Level 3 vehicle charger it is often necessary, due to the additional electrical load, for a Utility Customer to pay for the upgrade of the electrical service to their home. The Utility uses a variety of standards to determine the required service wire and distribution transformer size to support the requested upgrade. Originally, the complete cost was borne solely by the first homeowner's permit request, even though the transformer may be shared across many homes. This is consistent with section 18.5 of the Electric Utility Service Rules and Policies.

In recent years, the Utility has divided the cost of the transformer upgrade portion of the service upgrade across all customers connected to the transformer. The fractional transformer upgrade cost is typically about \$750 per customer. To date the utility has not had more than one customer request an upgrade per transformer, and thus has not recaptured any additional incremental costs, yet staff continues to track this data.

If charging of electrical vehicles is performed during non-peak hours (10PM-7AM) the number of transformers that need to be upgraded would be significantly lower. Moving all charging to off peak hours will also improve the efficiency of the grid and improve load factor of the utility, contributing to stability in one component of Utility rates.

DISCUSSION:

Utility staff propose amending the ordinance that requires customers to pay all the infrastructure upgrade charges related to residential electrical service upgrades. The amendment would eliminate the transformer upgrade portion of the service upgrade fee if an electrical vehicle charging station installation is included in the permit application. The two major benefits to the City for this change are: ensuring code compliant installation of charging equipment and improving the load factor of the Utility which

contributes to the stability of rates. Residential customers would still be required to pay for the service wire upgrade and installation.

Because transformers that serve residential load are typically lightly loaded during non-peak hours, the Utility is able to forgo the transformer upgrade with a customer's agreement to charge during non-peak hours. The movement to non-peak hours also reduces the possibility of contributing to the Utility peak demand. Finally, the electric utility's demand contributes to the IMEA peak demand, and by lowering this demand, less capacity must be procured by the agency, again contributing to stable energy prices for the Electric Utility customers.

If non-peak charging is not instituted there is a strong possibility that more transformers will have to be upgraded, and with larger transformers come additional infrastructure costs such as the upgrade of the wires to the transformers. These larger transformers also increase system losses during lightly loaded periods.

An additional condition of the waiver of transformer upgrade fees will be that the Utility will have the ability to review and utilize aggregate load data for EV charging installations. The Utility will analyze transformer load data, EV charging on the utility's system peak, as well as verify that charging is being completed during non-peak periods.

The charging of vehicles during non-peak hours will be further studied by the Utility and its rate consultant. Time of use rates will be evaluated during the rate study that is expected to be completed by Q3 2021. The utility will propose rate and cost of service adjustments to council in late 2021, to become effective on 1/1/2022.

FISCAL IMPACT:

If still required, upgrading a transformer to accommodate the extra load of a charger during a planned and coordinated outage will cost an average of \$6000 during normal business hours and the existing transformer may, depending on age and condition, be reused. If unpermitted charging occurs during peak hours and the charger was installed without a permit (and the utility was unable to upgrade the size of their equipment) this could damage the transformer and cause an outage for all customers serviced by that transformer. The emergency transformer replacement could cost up to \$10,000. Additionally, damaged transformers are not able to be re-used and it is not cost effective to have them repaired.

The Utility absorbing the transformer upgrade fee in exchange for non-peak charging will potentially save the utility \$179.42 monthly per charger in avoided demand charges to IMEA, if the vehicle is charging during the peak demand hour within the month. With this savings, the return on investment for the transformer upgrade is less than 34 months.